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CUBIC COSTS OF DIFFERENT TYPES OF SPACE

IN June 1948 we published figures on our standard five-room brick veneer house showing the cost per cubic foot of basement space, living space and attic, or roof space. In this bulletin we bring these figures up to date and add the figures on three more buildings.

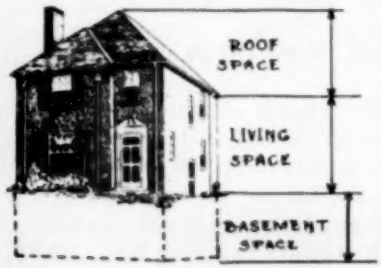
The basement space in these calculations extends from 6 inches below the top surface of the basement floor to the bottom side of the first floor joists. Living space includes that volume lying between the bottom side of the first floor joists and the top side of the second floor ceiling joists in the case of a two-story house. The roof, or attic space, includes that space enclosed by the outer surfaces of the roof and by the surface of the top side of the ceiling joists.

We have had letters from our subscribers asking for some explanation of the difference between the cubic costs of these four buildings and this bulletin will throw a good deal of light on the subject.

The sketches and tables in this bulletin will show the wide differences in the volume contained by the various types of space in each of the different buildings.

Naturally, the most expensive space in these houses is the living space, and the two-story brick house with its present cost of 85¢ per cubic foot has the highest-cost living space. This is because the living space is enclosed by 13-inch masonry walls. The frame enclosed living space of the California bungalow and six-room frame house costs 77¢ and 75¢ per cubic foot. Technically, the California bungalow does not have frame exterior walls. They are 2 x 4 studs covered with metal lath and stucco (no sheathing). The fact that the cube of the California bungalow living space is smaller than that of the six-room frame plus the fact that stucco is used instead of siding accounts for the higher cube cost of the living space in the

SIX-ROOM BRICK HOUSE



Type space	Cost	Volume	Cost per cu. ft.	% of total cost
Roof	$ 935	2,878	32.5¢	6.4
Living	12,106	14,222	85.0¢	82.4
Basement	1,650	6,000	27.5¢	11.2
Total	$14,691	23,100	63.6¢	100.0

smaller house. The brick work in the brick veneer house runs the cost of its living space up to 81.2¢ per cubic foot.

These unit costs can be substituted within reasonable limits to find the cost of other type houses. Suppose the two-story brick costing $14,691 were made of frame instead of brick. The cost of the living space would be about 75¢ per cubic foot, or $10,650, instead of $12,106. If all other specifications were the same, the total house cost would be $1,516 less, or $13,175. Since this house contains 23,100 cubic feet, the cubic cost of the entire frame house would be 57¢ vs. 63.6¢ for the same size brick house. Therefore, despite near-record lumber prices, frame construction in the St. Louis area is still considerably less expensive.

SIX-ROOM FRAME HOUSE

Type space	Cost	Volume	Cost per cu. ft.	% of total cost
Roof	$ 869	3,300	26.3¢	6.0
Living	11,878	15,876	75.0¢	82.1
Basement	1,726	6,200	27.8¢	11.9
Total	$14,473	25,376	57.0¢	100.0

The California-type bungalow if built of brick veneer would have living space costing about 81¢ per cubic foot, or about $6,825 vs. the stucco and metal lath cost of $6,480. This type of construction, while more substantial, would add about $345 to the total cost, making a brick veneer California-type bungalow cost about $7,925 in the St. Louis area. This would figure down to a cubic foot cost of 65.4¢ in contrast to the 62.5¢ cost of the stucco building.

FIVE-ROOM BRICK VENEER HOUSE

Type space	Cost	Volume	Cost per cu. ft.	% of total cost
Roof	$ 1,560	5,003	31.2¢	12.2
Living	9,030	11,125	81.2¢	70.3
Basement	2,255	8,782	25.6¢	17.5
Total	$12,845	24,910	51.6¢	100.0

In studying the variations in the cost of basement space, the high cost of the "basement" space for the California bungalow is immediately apparent. Actually, there is no basement. There is only a crawl space beneath the first floor joists.

SIX-ROOM CALIFORNIA BUNGALOW

Type space	Cost	Volume	Cost per cu. ft.	% of total cost
Roof	$ 720	2,480	29.0¢	9.5
Living	6,480	8,430	76.9¢	85.5
"Basement"	378	1,209	31.3¢	5.0
Total	$7,578	12,119	62.5¢	100.0

The foundation is poured concrete six inches thick in contrast to the 12-inch poured concrete foundations on the other three buildings. The cost of this "basement" space is made up of the foundation and the 4 x 4 supports and the footings beneath the foundation and supports.

The difference in the cost per cubic foot of roof space between the two-story brick house and the others lies in the fact that the brick house with its hip roof has a proportionately smaller volume than do the three other houses with their gable roofs.

It will be noticed that the five-room brick veneer house with its big gable roof shows a cost of only 31.2¢ per cubic foot for the roof space, but the total cost of this space is $1,560, or over 12% of the total house cost. The two-story brick with the hip roof has a higher cubic foot cost for this space, but the total cost of this space, $935, is just a little over 6% of the total house cost.

Another factor that contributes to the higher percentage roof cost in the one-story houses is the larger amount of roof necessary to cover a smaller volume of living space. For example, the roof area in the California bungalow only covers 8½ cubic feet of living space for each square foot of roof, and in the five-room brick veneer house this relationship is 9½ cubic feet of living space covered by each square foot of roof. On the other hand, the roof of the six-room frame (two-story) and the roof of the six-room brick (two-story) each covers 19 cubic feet of living space for each square foot.

Going back to a comparison of the basement costs we find the five-room brick veneer (one-story) house has the highest percentage of the total (17.5%). This is quickly explained by the larger perimeter of building usually necessary for a one-story house. The perimeter of the brick veneer house is 148 feet, while the perimeter of the two 2-story houses is 114 feet and 116 feet. Since the California bungalow has no basement, it cannot be brought into this comparison.

A further study of the various costs of these houses may be made in the use of the table on the following page. This table shows the percentage of total cost compared with the percentage of total volume for each type of space.

To illustrate, the table shows that the roof space of the five-room brick veneer house contains 20.5% of the total building volume and costs 12.2% of the total cost.

The same house has only 44.5% of its volume in living space and requires 70.3% of the total cost to construct this space. The other comparisons in the table are made in the same manner.

	Roof Space		Living Space		Basement Space	
	% tot. cost	% tot. vol.	% tot. cost	% tot. vol.	% tot. cost	% tot. vol.
5-room brick veneer	12.2	20.5	70.3	44.5	17.5	35.0
California-type bungalow	9.5	20.5	85.5	69.5	5.0	10.0
6-room frame	6.0	13.0	82.1	62.5	11.9	24.5
6-room brick	6.4	12.5	82.4	61.5	11.2	26.0